REMARKS

The Official Action dated October 1, 2002 has been received and carefully noted. The above new claims, and the following remarks, are submitted as a full and complete response thereto.

New claims 34 and 35 have been submitted to recite aspects of the invention which were disclosed in the specification as originally filed, for example, on page 11, lines 16-21, and elsewhere. No new matter has been added. Claims 1-35 are respectfully submitted for consideration.

Claims 1-33 were rejected under 35 USC § 103(a) as being unpatentable over Azuma (U.S. Patent No. 6,430,150) in view of Medard (U.S. Patent No. 6,047,331). The Official Action took the position that Azuma disclosed all of the elements of the claimed invention, with the exception of disclosing a destination and a source node. Medard is cited as disclosing an optical network with source nodes and destination nodes; the Official Action then took the position that it would have been obvious to a person of ordinary skill in the art to combine Azuma and Medard, to yield the claimed invention. Applicant respectfully traverses this rejection, and submits that each of claims 1-35 recite subject matter which is neither disclosed nor suggested in the cited prior art.

Independent claim 1, upon which claims 2-21 are dependent, recites a method for establishing a protection path for a failed link between first and second nodes in a mesh network wherein a transfer of information from the first node to the second node is disrupted by the failed link. The method comprises establishing an alternate path from

the second node to the first node via a destination-to-source communication channel. The destination-to-source communication channel is established through one or more alternate nodes beginning at the second node and ending at the first node. A switch function is executed at each of the alternate nodes traversed by the destination-to-source communication channel to allow source-to-destination information traffic flow from the first node to the second node along the alternate path defined by the destination-to-source communication channel. The information traffic flow is then switched at the first node from the failed link to the alternate path when the destination-to-source communication channel is established at the first node.

Independent claim 22, upon which claims 23-31 are dependent, is directed to a network protection configuration for use in optical mesh network topologies to reroute optical signals from a failed transmission path to one or more alternate transmission paths. The network protection configuration comprises an optical fiber network comprising a plurality of optical network nodes each coupled to transmit and receive optical signals carried on distinct wavelengths on optical fibers of the optical network. The optical network further comprises a source node attempting to transmit the optical signals via the failed transmission path and a destination node detecting the failed transmission path. A communication channel is established from the destination node to the source node to transmit a path failure notification. A route established by the destination-to-source communication channel traverses one or more of the optical network nodes, and defines the alternate transmission path. The network nodes defining

the alternate transmission path are switched in response to the path failure notification to facilitate source-to-destination transmission of the optical signals from the failed transmission path along the alternate path.

Independent claim 32 is directed to a network protection configuration for use in optical mesh network topologies to reroute optical signals from a failed transmission path to one or more alternate transmission paths. The network protection configuration comprises an optical fiber network comprising a plurality of optical network nodes, each coupled to transmit and receive optical signals carried on distinct wavelengths on optical fibers of the optical fiber network. Each of the plurality of optical network nodes comprises a fiber cross-connected circuit coupled to receive one or more of the optical fibers of the optical fiber network, and to switch the optical signals on the optical fibers to particular output ports of the fiber cross-connect to route the optical signals on the optical fibers to targeted optical fibers. An optical cross-connect circuit is coupled to receive one or more of the optical signals and to switch the optical signals to particular output ports of the optical cross-connect to route the optical signals to targeted ones of the optical fibers. A destination-to-source communication channel is established from a destination node detecting the failed transmission node, to a source node, to transmit a failed path notification. A route established by the destination-to-source communication channel traverses one or more of the optical network nodes, and defines the alternate transmission path. The fiber cross-connect and optical cross-connect circuit of the network nodes define the alternate transmission path, and are switched in response to the

failed path notification to facilitate source-to-destination transmission of the optical signals from the failed transmission path along the alternate path.

Independent claim 33 is directed to a method for establishing a protection path for a failed optical link between the source node and a destination node in an optical WDM mesh network. A transfer of optical signals from the source node to the destination node is suspended by the failed optical link. The method comprises detecting the failed optical link at the destination node by recognizing the loss of optical power at destination node cross-connect ports. A link failure signal is transmitted via a communication channel from the destination node, detecting the failed link to the source node through one or more alternate nodes. A cross-connect switch at each of the alternate nodes which receives the link failure is configured. The configuring comprises cross-connecting input ports to output ports of the cross-connect switch such that a source-to-destination protection path for transmission of the suspended optical signals is established as the link failure signal is transmitted from the destination node to the source node. The suspended optical signals are switched from the failed optical link to the source-to-destination protection path upon receipt of the link failure signal at the source node, whereby the source-to-destination protection path is set up using a destination-to-source communication channel.

As a result of the claimed configuration of the invention, optical communications in a mesh topology can be quickly restored in the event of a link failure. The claimed invention provides effective and efficient flexibility of routing within the network, and

uses a destination-to-source communication channel to establish the source-to-destination protection route. The link failure notification traveling through the destination-to-source communication channel is configured to switch each alternate node to reflect the alternate path, such that when the notification reaches the source, the alternate path is already configured through the alternate nodes. It is respectfully submitted that the prior art of Azuma and Medard, when viewed either singly or in combination, fails to disclose or suggest the claimed invention, and therefore fails to provide the critical and unobvious advantages discussed above.

Azuma discloses a communication node, a restoration method, and a communication network. The Official Action refers to Figure 5A, and column 2 of Azuma, as disclosing the elements of the present claims. However, Figure 5A of Azuma merely illustrates a failed link between nodes 5 and 6, and the corresponding discussion (appearing in column 7 of Azuma) indicates that when a failure occurs between nodes 5 and 6, a path connecting nodes 6, 2, 3, and 5 is set according to path restoration. Numerous path restoration methods appear to be discussed, but this would seem to include computation results being obtained at each node (column 5, lines 25-29), and a common computation algorithm for finding alternate paths. However, column 5, line 37 states that, after receiving a broadcast alarm message, each node enters the computation phase. This is a significant difference from the present invention, wherein a destination-to-source communication channel is set up through switching of information traffic flow through an alternate path. Independent claims 1, 22, 32, and 33 recite different methods

and apparatuses which accomplish this goal; it is respectfully submitted that there is no disclosure nor suggestion in Azuma of any alternate path which could be considered to be a destination-to-source communication channel, and wherein network nodes defining the alternate transmission path are switched in response to a path failure notification message to facilitate source-to-destination transmission of the optical signals from the failed transmission path along the alternate path. The claimed invention therefore results in the alternate path being essentially completely configured by the time that the failure notification message or the link failure message reaches the source node or the first node. This is significantly different from the configuration Azuma, which sends a broadcast alarm message which then initiates computation algorithms.

Medard discloses a method and apparatus for automatic protection switching. Medard, however, seems to be based upon a more conventional "tree" topology to ensure that any node in the topology or on the graph remains connected to the source node via at least one tree after the failure of a node or an edge. It is respectfully submitted that Medard, like Azuma, fails to disclose or suggest a configuration wherein a destination-to-source communication channel is used to switch nodes based upon a failure notification message or a link failure message such that an alternate path is configured by the time that the failure message reaches the source node.

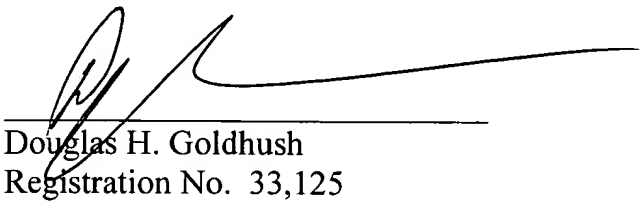
New claims 34 and 35 recite aspects of the invention which are discussed above and were disclosed in the specification as originally filed, and are consistent with aspects of the invention as discussed above.

In view of the above, applicant respectfully submits that each of claims 1-35 recite subject matter which is neither disclosed nor suggested in the cited prior art. It is respectfully submitted that the subject matter is more than sufficient to render the claimed invention unobvious to a person of ordinary skill in the art. Applicants therefore request that each of claims 1-35 be found allowable, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Copy of Revocation and New Power of Attorney as filed on January 27, 2003